

WHAT IS CLAIMED IS:

1. A combined cycle gas turbine system comprising; a steam turbine having a high pressure turbine, an intermediate pressure turbine and a low pressure turbine; a condenser for condensing exhaust steam of the low pressure turbine of the steam turbine; a gland steam condenser being connected to the condenser; a gas turbine having a compressor for compressing air, a combustor for combusting fuel with the air coming from the compressor and a turbine for expanding a high temperature combustion gas coming from the combustor for driving a generator; a cooling steam system for cooling the combustor and a blade of the turbine; and a waste heat recovery boiler having components of a feed water heater, an intermediate pressure superheater, and a reheater, and being fed with exhaust gas of the gas turbine so that condensed water coming from the condenser via the gland steam condenser may be heated and vaporized via the components of the waste heat recovery boiler for supplying steam to the high pressure, intermediate pressure and low pressure turbines, respectively, wherein the cooling steam system is constructed to comprise; a moving blade cooling system

having a demineralizer being connected to a downstream side of the condenser and a water sprayer being connected to the demineralizer for spraying water diverged from the condensed water into a passage for leading cooling steam from an outlet of the high pressure turbine to be supplied into a moving blade of the gas turbine; a stationary blade cooling system for leading a portion of the steam from the outlet of the high pressure turbine into a stationary blade of the gas turbine; and a combustor cooling system being fed with steam from the intermediate pressure superheater for cooling a transition piece of the combustor, and steam from the moving blade cooling system is recovered into the reheater and steam from the stationary blade cooling system and the combustor cooling system is recovered into an inlet of the intermediate pressure turbine.

2. A combined cycle gas turbine system as claimed in Claim 1, wherein water at an outlet of the demineralizer is heated at an economizer provided in the waste heat recovery boiler to be supplied into the water sprayer.

3. A combined cycle gas turbine system as claimed in Claim 2, wherein a sprayer is provided so that water diverged at an outlet of the economizer may be sprayed into the combustor cooling system.

4. A combined cycle gas turbine system as claimed in Claim 3, wherein a sprayer is provided so that water diverged at the outlet of the economizer may be sprayed into the stationary blade cooling system.

5. A combined cycle gas turbine system as claimed in claim 1, wherein a drain separator is provided downstream of each water spraying in the moving blade cooling system, the stationary blade cooling system and the combustor cooling system.

6. A combined cycle gas turbine system as claimed in Claim 4, wherein a filter is provided downstream of each of the drain separators provided in the moving blade cooling system, the stationary

blade cooling system and the combustor cooling system.

7. A combined cycle gas turbine system as claimed in claim 2, wherein a drain separator is provided downstream of each water spraying in the moving blade cooling system, the stationary blade cooling system and the combustor cooling system.

8. A combined cycle gas turbine system as claimed in claim 3, wherein a drain separator is provided downstream of each water spraying in the moving blade cooling system, the stationary blade cooling system and the combustor cooling system.

9. A combined cycle gas turbine system as claimed in claim 4, wherein a drain separator is provided downstream of each water spraying in the moving blade cooling system, the stationary blade cooling system and the combustor cooling system.